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ABSTRACT

A study of a single-sex learning environment was conducted in a public school, Edward Hand Middle School in Lancaster, Pennsylvania; sixth, seventh, and eighth grade students were grouped homogeneously by sex for all major subjects for a period of one semester and grouped heterogeneously for one semester. The study examined the effects that the single-sex learning environment had upon students' academic achievement and attitudes toward learning and behavior, according to student and teacher perceptions. Teachers' and students' perceptions of the single-sex environment at Edward Hand were studied as part of a graduate course in research methods in education. Data were gathered through a student survey and a teacher survey designed by the students in the graduate education course. Participants at Edward Hand originally included 80 students and 10 teachers, but because of the transient student population, only 35 students were available to be surveyed. Survey responses were analyzed with a non-parametric chi-square goodness of fit. Of the six questions for students, statistically significant results were obtained for three questions. On the teacher surveys, statistically significant results occurred on four of the seven questions. Results indicated that teachers and students perceive that single sex classrooms have educational benefits, such as improvements in self esteem, discipline, and academic growth for both male and female students. Contains 29 references. (BT)

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Student and Teacher Perceptions of a Single-Sex Middle School Learning Environment.

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Student and Teacher Perceptions of a Single-Sex Middle School Learning Environment

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The contention that students may learn better in single sex classrooms has gathered interest as schools search for ways to improve education. A search of the literature on ERIC revealed 49 articles addressing issues of single sex classrooms. The majority of the articles, 27, can be classified as supporting single sex classes, while 9 support coeducational classes. The remaining 13 articles do not indicate a positive or negative position, but report a related concern such as gender bias or legal issues. The literature reviewed suggests that females benefit from single sex education more than males, although the reasons for the benefits remain unclear. Further, the evidence suggests that there may be a difference between the optimum leaning environment for females and males. Males seem to thrive in a competitive and aggressive learning environment, while females seem to benefit most from a supportive and cooperative setting.

The literature suggests numerous advantages for females in single-sex classrooms. The girls show personal growth through improved confidence (Arbor 1998), a positive self-image (Lee 1986), and higher self-esteem (Bozzone 1994, Mael 1998). In the classroom, girls take more risks (Streitmatter 1997) and ask more questions (Streitmatter 1997, Stuttler 1997). Academically they perform better in math and Science (Schroeder 1998), show a greater, interest in academics (Lee 1986), and an increased educational ambition (Lee 1986). Upon graduation,

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girls from single-sex classrooms will seek better employment opportunities (Mael 1998). While there appears to be fewer advantages for males, they too benefit from improved self-esteem (Mael 1998), improved social interaction (Lee 1986), and tend to ask more questions in the classroom. (Arbor 1998)

The advantage of single-sex classrooms for girls seemed most evident in math and science classes and for improving self-esteem. Girls describe their experiences as "Freedom to excel without social pressures." (Leslie 1999). Many articles stress that students who were given the opportunity to participate in a single sex classroom were enthusiastic about being there. Even if they did not have a positive outlook at the outset, they often felt they had benefited by the conclusion. Most findings conclude that girls seem to benefit from single sex classrooms. In a study of a single-sex Algebra class, girls scored significantly higher exam scores, and the girls attributed this to the fact they did not need to compete with the boys (Stutler1997). Additionally, girls are more willing to take advanced math classes in single-sex schools (Koepke 1991, Marsh 1989).

The movement to single sex classrooms has somewhat been a product of studies showing girls do not have a positive experience in math and science classes when they are in coeducational schools and classrooms. Articles claim girls are somewhat neglected and shunned (Varites 1997), and they tend to exert less effort in studying math, thus limiting their future education and career choices (Strietmatter 1997). The contentions of Stutler and Leslie that girls are more successful in single-sex classrooms because of their perceived "Freedom to excel with out social pressures" and not needing to compete with the boys, makes single sex classrooms a logical solution for females in light of the concerns over girls' success in math and science in coeducational classrooms.

Not all studies, however, were as positive about the single-sex classroom. Some studies (Marsh 1989, Jones 1987, Schroeder 1998, Harker 1997, and Scheiner 1969) suggest that the coeducational classroom allows students of neither sex to be better prepared for society. One argument is that males and females do not work separately in the world of work; therefore, they should learn to work together early in their lives. Co-educational schools can provide a warm, friendly, and supportive atmosphere for both males and females, while teaching them to learn to work together productively. Coeducational schools can be academically beneficial to both sexes if policy makers address the bias in instruction toward males, so girls are given a fair chance to succeed (Jones 1987).

The research does not give conclusive arguments for or against coeducational schools, nor for or against single-sex schools. Additionally, there are very few studies of single-sex settings in public schools. This study of a single sex learning environment was conducted in a public school,t Edward Hand Middle School in Lancaster, Pennsylvania. Sixth, seventh and eighth grade students were grouped homogeneously by sex for all major subjects for a period of one semester and grouped heterogeneously for one semester. The study examined the effects that the single sex learning environment has upon students' academic achievement, attitudes toward learning, and behavior, according to student and teacher perceptions.

Methodology

In an effort to improve student learning, a group of teachers at Edward Hand Middle School decided to experiment with single-sex classes. Edward Hand is located in an urban setting, made up of primarily Hispanic and African-American students, a large percentage of which have lower socioeconomic backgrounds. The scoioeconomic status of the students' caregivers is suspected to be responsible for the transient nature of the student population.

As part of a graduate course in Research Methods in Education, we studied the teachers' and students' perceptions of the single-sex environment at Hand. Background information for the study was gained through an interview with a social studies teacher, one of the participants at Edward Hand. The data was gathered through a student survey and a teacher survey designed by the students in the methods of Research in Education course. Participants in the experiment originally included 80 students and 10 teachers. While all 10 teachers (6 males and 4 females) responded, due to the transient student population only 35 students (17 males and 18 females) were available to be surveyed. The survey responses were analyzed with a non-parametric chi-square goodness of fit.

Results

Student Survey

The results of the student survey revealed statistically significant results for the students' answers to three questions. There were no significant differences for three other questions. The questions with statistically significant results are:

1. Do you feel teachers treated you differently in single sex classes than in co-ed classes. (chi square = 7.529, $p<.05$)
2. Were your teachers: better in co-ed, better in single sex classes, or the same in both? (chi square = 11.886, $p<.05$)
3. Do you feel more comfortable answering questions in front of single sex classes or co-ed classes?

   (chi square = $p<.01$)

Student answers to the following questions produced no statistically significant results.

1. Would you like to be in a single sex classroom again?
2. Did you pay attention more in single sex classrooms?

3. Do you feel that the single sex classes helped you with attendance?

Two open ended questions asked students to identify which subject they enjoyed most in a single sex classroom and the best thing about being in a single sex class. All subjects were mentioned, however, social studies was identified most frequently. Although some students did not answer the second open ended question, the most frequent responses about the best thing in single sex classes related to being more comfortable, having no worries and having more friends.

In all the results form the student surveys, there were no significant differences in the responses of students based on sex of student.

Teacher Survey

When agree and somewhat agree responses were combined and compared to the number of disagree responses, statistically significant results occurred on four of the seven questions on the teacher survey. In addition, on two items, the results were significant if $p<.06$.

1. Students gained more academically in the single-sex classes. Eight teachers indicated agree or somewhat agree and two disagreed (chi square = 3.6, $p<.06$).
2. How would you rate student academic performance with single sex classes compared to regular classes? Seven teachers indicated somewhat or much better, two indicated the same and one indicated worse. (chi square = 6.2, $p<.05$)
3. There were less discipline problems in the single sex sections. Nine teachers responded agree or somewhat agree and one responded disagree. (chi square = 6.4, $p<.02$)
4. I related better to the students of the single-sex classes of my own gender. Nine teachers either disagreed or somewhat disagreed and one agree. (chi square = 6.2, $p<.05$)
5. Overall, both male and female students benefited from the single-sex experience.

Eight teachers indicated agree or somewhat agree and one indicated disagree. (chi square = 3.6, $p<.06$)

6. I feel that the single-sex classroom environment fostered self-esteem growth. Nine teachers indicated agree or somewhat agree and one disagreed. (chi square = 6.4, $p<.02$)

There were no statistically significant differences on this item:

1. You changed your teaching style in the single sex -sections when compared to the coed sections.

The teachers' sex and years of teaching experience did not interact with responses on any items.

Limitations of the study

- Only 35 students of the original 80 were available for the survey due to the transient population.
- A threat to the validity of the teacher survey exists because we combined agree and somewhat agree responses in order to compare agree and disagree responses.

Discussion

Results of the surveys indicate that the teachers and students at Hand Middle School perceive single sex classrooms have educational benefits. Teachers perceive those benefits to include improvements in learning, higher self esteem and fewer discipline problems. Students felt more comfortable to ask questions and that their teachers were better. How do these perceptions relate to studies reported in the literature previously and what do these studies suggest about single sex learning experiences?

When relating our findings to those in the literature, striking similarities are evident. The majority of studies we reviewed in the literature indicated improvements for female students. The literature strongly indicates improvements in self esteem, discipline and academic growth in single sex learning environment. Our findings are consistent with these results.

In addition to these similarities, there are important differences. Our study indicates the perceptions of improvements in self esteem, discipline and academic growth apply to both male and female students. While the literature reporting studies for specific disciplines focuses on math or science, this study included all the subjects of middle school study.

In addition, according to the literature we reviewed, no studies examined student perceptions of teacher performance. In this study, students perceived teachers as being better teachers in single sex classes and that teachers treated them differently in those classes. In contrast, the teachers reported they had not changed their teaching styles in single sex classes and that they did not relate better to students in same sex classes. These results suggest, therefore, other explanations for the student perceptions. Could the student perceptions about teachers be explained by the improvement in academic progress resulting from student comfort in asking questions, greater confidence and the need for fewer disciplinary actions by teachers? Even though the teachers think they are teaching in the same way, they could certainly seem to be doing a better job teaching in those circumstances.

Our findings add strength to the existing literature supporting single sex learning environments. Given the unlikely scenario, however, of the proliferation of single sex classes despite the increasing supportive evidence, we recommend individual teachers seriously consider the educational advantages of some single sex learning experiences within their classes. Research on this approach to single sex learning needs to be conducted.

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